

1978

Dickey-Lincoln School Lakes, Maine, Hydro-Power Decision, October 27, 1978

James B. Longley

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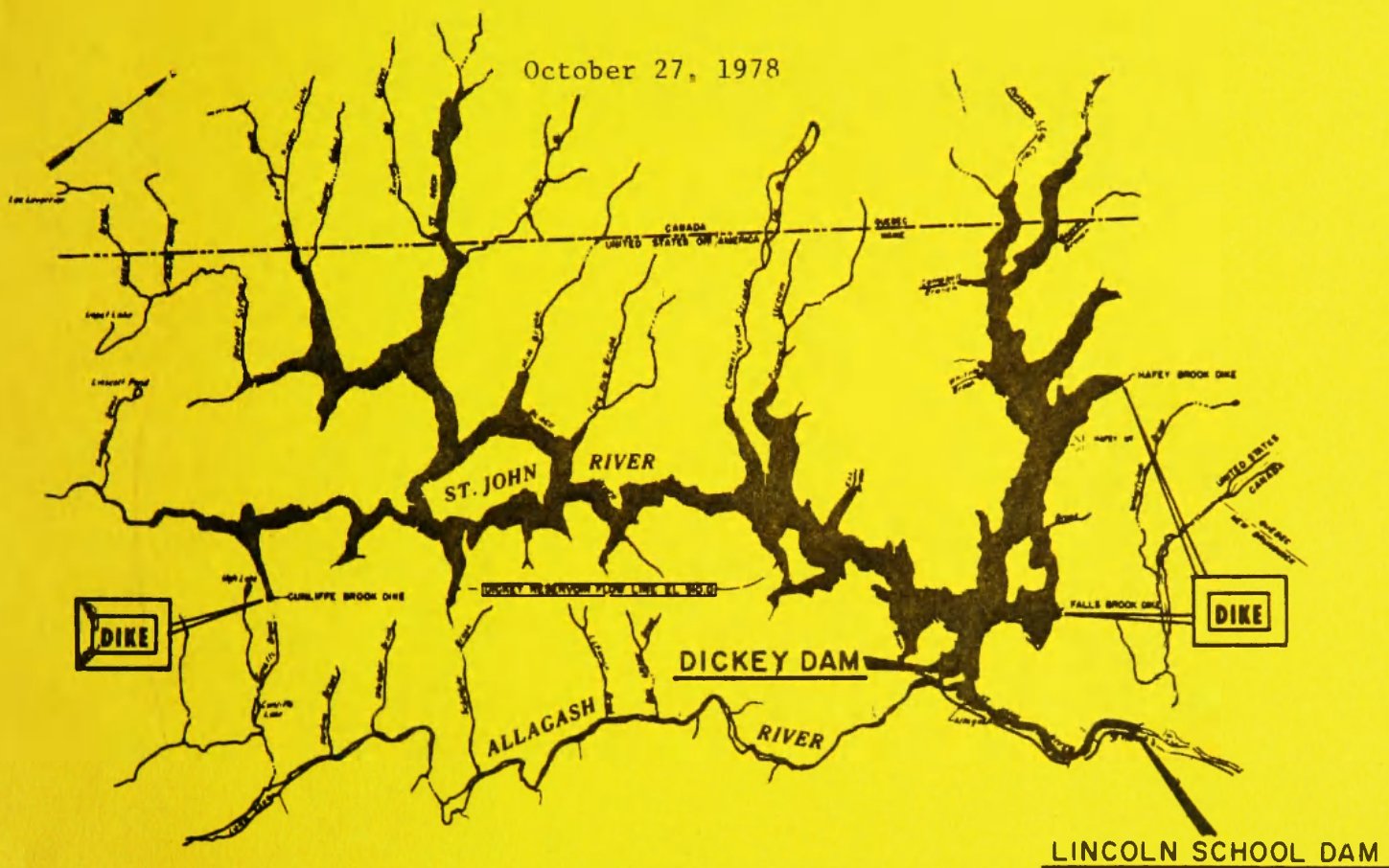
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DICKEY-LINCOLN SCHOOL LAKES

MAINE

HYDRO-POWER DECISION



GOVERNOR JAMES B. LONGLEY

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DICKEY-LINCOLN PROJECT

LETTER

TO: PRESIDENT JIMMY CARTER

FROM: GOVERNOR JAMES B. LONGLEY



STATE OF MAINE
OFFICE OF THE GOVERNOR
AUGUSTA, MAINE 04333

October 26, 1978

President Jimmy Carter
White House
Washington, D. C.

Re: DICKY-LINCOLN WATER PROJECT

Dear President Carter:

First of all, I want you and the staff at the White House to know that I am deeply appreciative for the input, suggestions and counsel provided me as Governor of Maine with respect to the Dickey-Lincoln and related type water projects. As a matter of fact, very early in my deliberations on this proposed project, which many feel could either be the best thing to happen to Maine or the worst thing to happen to Maine for present and future generations of Maine people, I was provided a copy of a handwritten memo by Governor Jimmy Carter dated October 1, 1973 as it relates to the Spewrell Bluff Dam, by some of our mutual friends who felt your and my approach in matters of consequence and government are similar; as is the problem you faced and I am now facing with respect to the Dickey-Lincoln Project.

More than coincidentally, I have referred to and read your memo a number of times and now have it before me and there is also a similarity to the extent of our mutual experiences. I say this because your very opening sentence in your memo states to wit: "My decision on whether Spewrell Bluff Dam should be built is one of the most difficult I have had to make with the exception of state government reorganization which has been the most time-consuming." With the exception of the fact that I have spent much more time on the unfortunate Indian Land Claim than state government reorganization, my experience has unfortunately been the same as your own experience as Governor of Georgia.

I too "have personally read all the written reports and transcripts of oral testimony made available to me" as you indicated in your memo. I too have consulted with many people and delegations and I too have read and analyzed thousands of letters and telegrams and petitions and resolutions. I too have traversed the river and area by foot, by vehicle, canoe, as well as by helicopter. My family, too, has used the privacy of our homes to receive as well as discuss differing views.

While your memo also indicates "there is no way to win politically because of the large number of people who insistently and intensely either favor or oppose construction of this dam," I too have tried to divorce politics from my determination and perhaps as an Independent Governor not concerned with or seeking re-election or election to any office, I have had some relief from pressure groups and what you also refer to as "special interests" to the extent that I have probably been spared some of the pressure that was applied to you in your decision.

On that note, as you are undoubtedly aware, there is considerable speculation that the White House is currently directly or indirectly playing "political games" on this question by virtue of the fact they have "impounded" or at least "embargoed" the Final Environmental Impact Statement which was promised as late or as early as August 17th by the Corps of Engineers. However, I want to be extremely fair to the Corps and specifically to Colonel Chandler who I think has been outstanding and a credit to the United States Army, the White House and to the people of America. I say this

because you are well aware and one or more mutual friends have told you and I, that the press frequently reports the Corps of Engineers "plays games" or has been accused in the past on other projects of having total disregard for the land or the water or the environment, and that it wants to build projects anywhere or everywhere to justify its existence and its budget and too frequently proceeds on the basis that "the end justifies the means." From my standpoint, this type of accusation and criticism is totally unfair as it relates to Colonel Chandler and the Corps of Engineers regarding the Dickey-Lincoln Project. I have nothing but commendation as well as pride and appreciation for the fair method and manner with which Colonel Chandler has treated the citizens of Maine and this Governor during the course of his studies and hearings and his responsiveness on the Dickey-Lincoln Project. Therefore, while I do not want to lend any credence to criticism of you or the White House, I would say that if political games are being played in withholding the FEIS until after the present election on November 7th or later, or until there is a new Congressional Delegation and/or Governor of Maine....I have already received sufficient information relative to the FEIS so that I feel I am able to make a final decision and my recommendation to you as President. In other words, even though I am advised there is some unhappiness on the part of your staff with the Corps of Engineers or the FEIS on a Section 404 problem or sufficient detail concerning wet lands or fisheries and wildlife, I am advised that they are inconsequential and de minimus as it relates to the total project and the overwhelming facts and factors that we have already studied. As a matter of fact, based on your previous expression on water projects and budgetary concerns for waste and bureaucracy and your excellent anti-inflationary challenge, I cannot believe you would follow any different approach as Governor of Maine or as Governor of Georgia than I am forwarding today.

Also, more than coincidentally, I share completely and unequivocally the additional statements contained in your memorandum of October 1, 1973 on the Georgia project, which convey my strong and unequivocal feelings on the State of Maine project, to wit: "As Governor, as an outdoorsman, as a businessman interested in the optimum economic development of Georgia (Maine), and as one who perhaps will make the final decision on this project, I have tried to assess fairly all factors involved." Very candidly, I feel this applies equally to the State of Maine - unless you now as President of the United States apply a different standard to an independent Governor of Maine than you expected and obviously received from a Republican President out of respect to you as the Democratic Governor of Georgia in 1973.

Another excellent sentiment and quote from your very judicious memorandum demonstrates once again there is a very strong similarity of resolution as well as in approach between one Jimmy Carter and one Jim Longley to the extent you also said. ...

"in my mind there is no doubt that I have made the correct recommendation or decision."

As a former Governor, now the President of the United States, you have also indicated and I will now reiterate that "it is impossible to analyze in a brief statement all the complicated and constantly changing issues" ... but you will find enclosed herewith an in-depth analysis of the major points of consideration and my conclusion, based on the best expertise provided me and my own analysis and research that

"THE PROPOSED DICKEY-LINCOLN WATER PROJECT, AS PRESENTLY CONSTITUTED, WOULD BE GROSSLY UNFAIR TO THE PRESENT AND FUTURE GENERATIONS OF MAINE PEOPLE AND A WASTE OF FEDERAL AND STATE OF MAINE TAXPAYER DOLLARS AND I, THEREFORE, AS GOVERNOR OF MAINE, DO IN FACT EXPRESS MY OPPOSITION TO THIS PROJECT AND RESPECTFULLY REQUEST THAT YOU AS PRESIDENT SUPPORT THIS RECOMMENDATION."

More than coincidentally, I felt that it would also be inflationary as well as a slap-in-the-face and a breach of faith to the voters of Maine for this Governor, or any Governor of Maine for that matter, to do other than strongly oppose this project as presently contemplated based on the facts and the overwhelming expression of the voters of Maine in opposition to a public power question in 1973. Furthermore, my recommendation that you deny this project or avoid further waste of taxpayer dollars on this specific project is based on the following additional specifics:

(1) The voters of Maine in 1973 overwhelmingly voted against public power and at the very least, a Governor should not approve or even condone or support any effort toward state or federal public power projects in Maine, in denial of the due process as demonstrated at the ballot box by the voters of Maine in 1973, without allowing the voters of Maine to vote on any public power project, federal or state.

(2) Separate and apart from the public power issue, I oppose this project because despite very obvious advantages of federal dollars and/or job benefits, the adverse impacts of "the bust cycle" and the destruction, or at the very least, negative disruption of a beautiful river plus the land and natural resources combined with a negative social economic impact on present and future generations of Maine people far outweigh any present short range economic advantages.

(3) Despite repeated attempts and requests of supporters of the project and despite diligent research and analysis by independent and state government expertise, I have been provided with very little evidence, almost totally speculative, that there is any substantial economic or environmental benefit for the people of Maine once the project is completed. On the other hand, I have given great consideration to an excellent point made by our mutual good friend, Senator Ed Muskie, to the effect that "once the project is completed and water starts flowing, it is very unlikely the unit cost(s) will ever increase."

(4) Despite extensive research and development of cost benefit data as it relates to present and future energy considerations, there is lack of convincing evidence that this is the best present form of energy development for the State of Maine and the region or the nation as it relates to either long range or short range energy advantage(s) and/or even a comparative advantage as it relates to the potential for one or more alternatives in the form of improved conservation, nuclear, tidal, wood, solar, wind, methanol, hydro, including present small dam capability here in Maine, let alone exciting developments my research has uncovered in the areas of improved technological and scientific developments in refinery capability, offshore both surface as well as ocean floor development, predicated on the submarine expertise and experience with which you are familiar, which could actually lead to ocean floor refineries and/or communities involved with energy as well as aquaculture development. Yes, we have done both our homework and the time spent in research and in studying this problem is at least the equal of what you indicated directly and I have heard indirectly you invested in behalf of the people of Georgia. I want you to know that I have done this not only in behalf of the people of Maine, but by virtue of the changing energy picture since your decision in 1973. I have also very carefully considered the problem and the potential benefit of Dickey-Lincoln as it relates to the region and the nation as well, by virtue of the emergence of the energy program even though I am not certain I agree with your extreme position that it is "the moral equivalent of war." However, to the extent your statement was a challenge to America, then I think Americans - including this Governor - have tried to be responsive and as Dr. Schlesinger well knows, this Governor was among the first - if not the first - to initially embrace your energy objectives, subject to minor refinements, and I was also most responsive to the calls from your staff, including Dr. Schlesinger in recent months, in seeking the support of the Maine Congressional Delegation and others, for your program. So, I am as delighted as you must be to see that the Congress has finally passed energy legislation.

For your further information and background, I am also sharing with you additional specifics with respect to the research and thinking and factors we carefully studied and analyzed in the following areas:

(1) Thousands of Maine citizens have expressed themselves through numerous forums, including the National Environmental Protection Act (NEPA) process on this project. Additionally, I commissioned a blue-ribbon panel of Maine citizens as a project review committee to consider the project from the widest possible perspective. The State Department of Conservation, the State Office of Energy Resources and the State Development Office have each conducted independent reviews. Finally, I have spoken to hundreds of Maine citizens and individuals from all over our Country with specific expertise relating to this project; and personally journeyed to the project site on a number of occasions to assure a first-hand knowledge of the location and geography before I reached the conclusions and decisions and recommendation as already stated.

(2) Mr. President, the decisions I have reached are in consonance with Maine's Energy Plan which provides for developments only when economically sound and environmentally feasible. The economics of this project are questionable at best. Numerous benefit-cost studies have been done, each with a different conclusion. The myriad of possibilities and the overwhelming uncertainties of the 100-year projections precludes definitive economic analysis and thus leaves one the opportunity to pick his own expert with his figures to support almost any position. Even the most ardent proponents of the Dickey-Lincoln project agree that the environmental impact of Maine's land resources are a major consideration. One land use consultant has estimated that the area directly affected would be at least 500,000 acres.

(3) I have come to the conclusion that the St. John River may well be essential to our economic health and energy requirements. However, I am not satisfied that we have in the Dickey-Lincoln Project the optimum use of the River's resources. Approximately 33% of any power benefit derived for Maine from Dickey-Lincoln would not come from the project per se, but from downstream Canadian generation at the discretion of the Canadians at a cost to be set at some future date. Additionally, Dickey-Lincoln is designed primarily as a peaking-power project. A Maine-oriented base-load development on the St. John would be much more important to Maine's long-term economic health than would the present proposal. I am advised that very little if any industrial development is influenced by peaking power as contrasted by base load power.

(4) We have embarked on serious considerations of several alternate energy sources for Maine. We are anxious to pursue several viable energy opportunities to reduce our State's dependence on oil energy. We are convinced that proper integration of the many diverse sources available to us can provide a solution that will improve the economy immeasurably without the cost or risk of Dickey-Lincoln. Conservation alone can save the equivalent of 11,600,000 barrels of fuel by 1985. Conservation should not be viewed as going without or reducing our standard of living or economic growth, but as an attack on wasted energy. Proper building insulation alone would be a major investment; however, the results are semi-permanent and significant. A recent study indicates that 56% of Maine homes now use wood in some form for heating. One of Maine's major industries recently chose to build a wood fuel-fired facility over oil or a hydro-electric plant. The use of wood for fuel is moving swiftly, and surely now is the time to consider the implications of 100% use of Maine's timber growth. These and the integrated and proper use of Maine's existing dam sites, the proper utilization of coal, solar, wind, nuclear and co-generation are urgent considerations. Every day the Maine Yankee Plant at Wiscasset simply dissipates heat equivalent to 960,000 gallons of No. 2 fuel into the river. These alternate sources of energy require an injection of research and implementation effort because they contribute positively to our Balance of Payments and inflation problems and reduce our dependence on OPEC.

(5) One of the major impacts of this project, and one that has not received sufficient attention is the devastating impact of the transmission system which would cut a swarth through some of Maine's most wild and scenic areas and across free-flowing rivers for 206 miles with a 150 foot right of way and require 4,080 acres.

In addition to the information which we have supplied in this letter, we have also prepared supplemental data and attachments which will be provided you.

My request, Mr. President, is that you will appreciate the integrity of my decision, to oppose this project for my reasons as already stated to wit:

"THE PROPOSED DICKEY-LINCOLN WATER PROJECT, AS PRESENTLY CONSTITUTED, WOULD BE GROSSLY UNFAIR TO THE PRESENT AND FUTURE GENERATIONS OF MAINE PEOPLE AND A WASTE OF FEDERAL AND STATE OF MAINE TAXPAYER DOLLARS. ..AND I, THEREFORE, AS GOVERNOR OF MAINE, DO IN FACT EXPRESS MY OPPOSITION TO THIS PROJECT AND RESPECTFULLY REQUEST THAT YOU AS PRESIDENT SUPPORT THIS RECOMMENDATION."

Very truly yours,


James B. Longley

JBL:bh

cc: Clifford L. Alexander, Jr., Secretary of the Army
James T. McIntyre, Jr., Director of the Office of Management & Budget
Charles H. Warren, Chairman, CEQ
Douglas M. Costle, Administrator, EPA
General Morriss, Chief of Engineers
Colonel Chandler, District Engineer
James Schlesinger, Secretary, Department of Energy
Maine Congressional Delegation

ATTACHMENT I

DICKEY-LINCOLN PROJECT

PROJECT DESCRIPTION

ENVIRONMENTAL IMPACT

CONSIDERATIONS & CONCLUSIONS

DECISION

PROJECT DESCRIPTION

As proposed, the Dickey-Lincoln School Project would cost approximately \$1 billion. It would consist of two earthfill structures designed to produce peaking and modest intermediate load power from the St. John River. The larger of the two dams, the Dickey Dam, would be located immediately above the confluence of the Allagash and St. John Rivers. The Lincoln School Dam would also be located on the Upper St. John River, eleven miles downstream from the Dickey Dam.

The Dickey Dam would have a total length of 10,600 feet and a maximum height of 335 feet. The Lincoln School Dam is considerably smaller and would be 1,600 feet long and have a maximum height of 85 feet.

The project would be operated principally, although not totally, as a peaking power plant. The peaking power aspect does not require a high energy producing facility. It would operate for short periods to meet the daily peak electrical demands of New England. The initial installed capacity of the project would be 840 MW with a future potential of 1,210 MW. The operation of Dickey Dam's power facilities can vary from 2½ hours daily for seven days a week to 3½ hours daily for five days a week. The large storage capacity of the lake would be replenished by the spring runoff, metered during the summer, and reach its lowest level when drawn down to help meet the high winter peak need for electrical energy in New England.

The Lincoln School Dam can normally operate 10 hours per day, seven days a week. Although this dam is designed to regulate and even out the St. John River flow, it also provides some flood prevention benefits, as well as base power for part of Northern Maine.

In the event of an electrical blackout, the Project is capable of generating electricity for a continuous period of up to 35 days. But, under normal conditions the Project will generate electricity only 3 hours a day for 12 months a year.

Dickey-Lincoln is designed to supply peaking power to all of New England via some 400 miles of high voltage transmission lines connecting the Northern Aroostook generating plants with the Southern New England load centers. Under the preference provisions, under which the power is marketed by the Department of the Interior, small amounts of base load power could be delivered to Maine users served by Maine's utilities. Additional discussion of the "Preference Clause" is provided in Attachment IV.

In addition to the description of the Project itself, I feel there are other major factors which should be highlighted.

(1) The construction of the Project would most certainly have a economic impact on Maine, particularly Northern Maine. Conservative estimates have placed the economic impact at \$800 million; it would more likely approach \$1 billion.

(2) Construction of the dams would require the displacement of the entire community of Allagash. The loss of this entire community must be viewed as a major consideration.

(3) The Project would account for between 15 and 20 percent of the New England regions peaking capacity requirements by the 1980's. However, the Project would account for less than three percent (3%) of the total energy requirements of the region.

(4) Approximately 88,000 acres would be flooded by the Project, and a Department of Conservation study indicates that an additional 206,000 acres of forest land would be isolated from Maine wood markets to the extent that access and egress would be through Canada for the most part. New transmission line rights-of-way and associated access roads would require another 4,083 acres. These figures certainly indicate that the Project has a major impact on Maine land resources, all of which are now privately owned and would be subject to eminent domain seizure.

ENVIRONMENTAL IMPACT

There is little question but that the construction of the Project would have a major, adverse environmental impact. There appears to be little dispute in this area, even from the most ardent proponents of the Project.

Overall, from the standpoint of the stability and productivity of the existing natural environment, the Project will clearly have an adverse impact. One consultant has estimated that due to the shape and location of reservoirs, the effect on roads and mills, acreage for mitigation of wildlife habitat, dams, transmission lines and access roads, the area directly affected is at least 500,000 acres. In addition, there will be adverse impact on a beautiful and aesthetic river and land, as well as some unfavorable impact to future productivity of major acreage of commercial forest land due to the impoundment and buffer zone, transmission lines and isolation.

The Project would, in addition to despoiling one of the few remaining real wild areas and free-flowing rivers in the Eastern United States, also would unfortunately have transmission lines cross primitive wild areas and rivers in Northern Maine, as well as create a ditch-type environment on beautiful fields, countryside and areas bordering some of our most beautiful towns and recreation and wildlife areas.

Some of the most productive forest lands in the watershed occur within the area are to be inundated. 88,000 acres would be flooded by the project. New transmission line right-of-ways and access roads would require 4,083 acres. 13,400 acres of forest land would exist as islands, being less accessible for harvesting. An additional 206,000 acres of forest land would be isolated from Maine wood industry markets.

White water canoeing and wilderness camping would be adversely impacted, if not in fact destroyed, in the Project area. The new benefits from man-made recreation attractions will largely depend on the investments in facilities such as campsites, beaches, nature trails, etc., and the vagaries of the lake fishery.

CONSIDERATIONS EVALUATED AND CONCLUSIONS REACHED

(1) A decision on this Project cannot be reached solely on the basis of economic considerations. We do not have a right, in this generation, to commit a significant portion of our valuable wilderness land to a project based solely on the fact that it will temporarily stimulate the economy by a construction boom because the risk to future generations of a bust cycle far offsets the potential long-term value of the boom cycle. Additionally, the Project certainly could not be justified by the number of permanent jobs it would create. Finally, analysis of the several proposed cost-benefit computations with their several different interest rates, the myriad of possible considerations, and the overwhelming uncertainties of one hundred years, precludes definitive or accurate economic analysis and thus leaves one the opportunity to pick and choose at will a set of figures supplied by one's favorite expert to support almost any position. (see Attachment II)

(2) The Project should not be rejected solely on the basis that it would represent a loss of scenic or wilderness areas to be used by present and future generations for recreation purposes.

(3) Maine must assume the responsibility of providing a fair share of the energy needs of the state and the nation. Statistics show that Maine has been providing its fair share of electrical energy in New England and we must continue to make this so.

DECISION

(1) The federal government is still struggling to develop a clear energy policy and direction; and it simply is not reasonable to suggest that Maine endorse the Dickey-Lincoln Project in this vacuum. To do so would not be unlike placing one tiny piece of a large and complex puzzle on a table and waiting to see if the unknown parts will ultimately fit.

(2) Maine will continue to assume its full responsibility to shoulder its fair share of the energy burden without undertaking this project at this time, which would have, as I view it, minimal returns for a maximum sacrifice.

(3) I have stated on many occasions that I do not feel any individual or group has the luxury to oppose each and every energy proposal on environmental grounds without providing viable alternatives to the energy problem. We do not have a right to say what we are against without saying what we are for so that realistic trade-offs and viable compromises can be reached.

Therefore, while I oppose the construction of the Dickey-Lincoln Project, I will support for the remainder of my term as Governor, and as a future private citizen, the following:

(1) Continued planning and construction of Maine's base-load generating capabilities.

(2) Accelerated resource and development of the construction of additional nuclear facilities with reasonable safeguards relating to safety and waste disposals. In that regard, I am on this date advising all concerned state departments and agencies of the urgency of the energy problem, the need to expedite and shorten long lead-times and to give priority consideration, within the scope of Maine's existing laws, to requests for permits and licenses. I am convinced that Maine can continue to produce its share of base-load electricity without endangering its unique environment.

(3) I am this date directing the Office of Energy Resources to accelerate their programs to develop alternative solutions to have Maine provide its fair share of "peaking" capabilities. This should include progress reports on the utilization and impact of a series of smaller hydro projects on Maine's rivers, tidal projects, nuclear proposals, and pumped storage possibilities with a formal plan to cooperate with private utilities on a conservation program, particularly during peak periods in Maine or during periods when Maine should conserve to accommodate peaks in other areas of New England.

(4) Should there be continued efforts in the future to proceed with the Dickey-Lincoln Project, I would ask the Maine Legislature to take whatever action is necessary to see that all the citizens of the State of Maine are given an opportunity to express their opinions on the Project at the ballot box. In making my own decision to oppose the Project, I could not ignore the fact that as recent as November, 1973, the people of Maine were given the opportunity to speak to the Public Power issue and they overwhelmingly defeated... at the ballot box. a Public Power referendum. Construction of the Dickey-Lincoln Project by the U.S. Army Corps of Engineers to be operated by a public authority could, in effect, be a backdoor approach to bringing Public Power to Maine to the extent that it establishes a New England Public Power Project at the expense of Maine landowners and both federal and state taxpayers. That being the case, I consider it only reasonable and appropriate that the citizens of Maine would at the very least be given the opportunity to reverse this expression prior to any support at the State level. No public official should circumvent the position of a majority of the people of a state once it has been expressed at the ballot box.

A summary of Pros and Cons for many of the elements considered in reaching this decision is contained in Attachment II.

DICKEY-LINCOLN PROJECT

Decision Matrix

Summary

Pros and Cons

AREAS OF CONCERN

- A. Energy Economics
 - a. Energy Demand
 - b. Energy Alternatives
 - c. Construction Economics
 - d. Marketing
- B. Community and Economic Impacts
 - a. Relocation
 - b. Job Impacts
 - c. Flood Control
- C. Environmental Impacts
 - a. Terrestrial Ecosystem
 - b. Forest Resources
 - c. Wildlife
 - d. Fisheries
 - e. Recreation
 - f. Land Uses
 - g. Geology and Safety
- D. Conservation

AREAS OF CONCERN

A. ENERGY ECONOMICS

This summary is heavily dependent upon the energy analysis for the Dickey-Lincoln School Project prepared by Acres-American Inc. under contract with the U.S. Army Corps of Engineers.

Reports indicate that, in the absence of major changes in lifestyles, the capacity of the Dickey-Lincoln project may be needed in the 1980's. Sub-Section a presents the pro and con arguments in the area of ENERGY DEMAND.

Sub-Section b considers the following Energy Alternatives:

Direct Generation

- Nuclear-Steam Cycle
- Conventional Fossil Thermal Steam Cycle
- Gas Turbines
- Hydroelectric
- Combined Cycle
- Power Purchases
- Solar Wind
- Small Hydro
- Tidal

Energy Storage

- Conventional Pumped Hydro
- Lead-acid Batteries
- Compressed Air Storage

It is important to note that, although Dickey-Lincoln is a peak load plant, both peak load plants and base load plants when combined with a storage capability can be considered alternatives to Dickey-Lincoln. Geothermal sources were rejected because of unproven resources and economics in the New England area. Advanced nuclear cycles such as the "breeder reactor" were excluded since they are not likely to replace the conventional reactor in the U.S. nuclear scene before 1990 and fusion applications probably not 'til the turn of the century.

SUB-SECTION c, CONSTRUCTION ECONOMICS, reviews the findings of the economic analysis for the project and presents the controversies regarding the methodologies used by the Corps in undertaking the economic assessments of the project.

SUB-SECTION d, MARKETING, reviews the marketing and strategy for power, the allocation of a portion of the base load power to Maine, most of the peaking capacity to southern New England and concerns with the "Preference Clause"

*NOTE:

Pro and con statements address specifically the sub-headed subject per se.

A. ENERGY ECONOMICS (Continued)

ENERGY DEMAND

Pros

1. NEEPOOL projects that power demands in New England will grow at 5.4% annually indicating a need for peaking power such as could be provided by the Dickey-Lincoln Project. The New England Regional Commission energy project made a similar projection. An alternative projection by the Corps consultant reported an annual growth rate of 5.2% which also indicates a future need for Dickey-Lincoln energy.
2. The project would account for between 15 and 20 percent of the New England regions "peaking capacity" requirements by the 1980's.
3. Private power projections indicate that Maine will need additional power - both base load and peaking by the time Dickey-Lincoln is on line.
4. Load Management and Conservation can reduce generating capability requirements, however, that reduction in capacity requirements will not eliminate the need for additions to the system based upon future demand requirements. In addition, Load Management depends upon changing State laws (PUC regulations).
5. The public and industries expect government and utilities to assure an energy supply with minimum impact on living standards.
6. Many households shifting to wood are installing electricity as a backup source of heat.

Cons

1. All forecasts are based on industry figures and may not be an accurate measure of what capacity is actually needed in the future. An independent assessment of future demand is needed.
2. The project would account for less than 3% of the energy requirements of the New England Region.
3. Maine exports power. The project is for New England benefit - Maine does not need it.

Industry is not interested in peak power. New industry is induced by a significant differential in the cost of base power.
4. Load Management and serious Conservation efforts could reduce the need for future peaking power and, therefore, Dickey-Lincoln.
5. Approximately 33% of any base power derived for Maine would not come from the project but from downstream Canadian generation at the discretion of the Canadians where no treaty or agreement exists to assure an economical and continuous supply.

i. Nuclear and Conventional Fossil
Thermal Steam Cycle AlternativePros

1. Both nuclear and conventional fossil thermal steam plants are designed for base load power generation. These plants operate most efficiently at fixed and continuous levels of operation as opposed to the intermittent operation of peaking plants. It is prohibitively expensive to regularly vary the level of output at these thermal steam plants or to build a thermal steam plant primarily as a peak load plant.
2. Whether or not these base load plants can produce off-peak power to be stored and sold during peak periods at prices competitive with Dickey-Lincoln over the long run is not certain.
3. Nuclear energy is, and must be, a component of the nations energy supply. The Maine Yankee facility has been immensely successful.
4. The Maine Yankee nuclear power facility at Wiscasset, Maine generates 10 times the power of the proposed Dickey-Lincoln project with no appreciable environmental impact.

Cons

1. Although nuclear and fossil fuel cannot be considered as direct alternatives to Dickey-Lincoln as peak power plants, they must be considered as one component in an alternative mix. Nuclear and fossil fuel base plants can produce off peak power to be stored for use during peaking periods. The storage options include conventional pumped hydro, lead-acid batteries, compressed air storage and underground pumped hydro. Each of these is discussed separately in the section on power storage alternatives.
2. The uncertainties here relate to the future price and availability of oil, coal, and uranium; and to the technological developments in the breeder reactor.
3. Nuclear wastes are a national responsibility and proper storage must be rapidly demonstrated along with a better understanding by the public of nuclear developments.

ii. Gas Turbines Alternative

1. Gas turbines were found to be more expensive than Dickey-Lincoln. They are expected to be even more so over the long run as the price of the fuel (Oil) for the gas turbines continues to increase.
2. Gas Turbines run on an oil-based fuel.

1. The Acres-American Study found Gas Turbines to be an alternative to Dickey-Lincoln. The Citizen's Impact Review Committee concurred. Although Gas Turbines are more expensive than Dickey-Lincoln, the environmental problems are generally minimal.
2. Gas Turbines can be constructed near the load center to minimize transmission losses and the need to construct new transmission systems. Oil-based fuel is subject to OPEC vacillations and also impacts adversely on balance-of-payments and national inflation problems.

iii. Conventional Hydro with Storage Capacity for Peaking AlternativeProsCons

1. The benefit to cost ratio for these alternatives was in no case more than one.
2. Of the six sites mentioned only one (Cold Stream, CMP) is being given serious consideration by the Private Sector.
3. These relatively high capacity hydro facilities (needed to generate peaking power) would require impoundments inevitably causing a disruption of the natural ecology of the water course and surrounding area. These environmental impacts although more dispersed, could be as significant as those of the Dickey-Lincoln Project.

1. According to the U.S. Army Corps consultant, approximately 1,000 MW of capacity is available from six New England hydro sites with individual capacities of 90 MW or more. In terms of the amount of peaking power this is an alternative to Dickey-Lincoln.
2. The benefit to cost ratio of Conventional Hydro is only mildly subject to inflation.

iv. Combined Cycle Alternatives

1. Combined cycle plants utilize oil as fuel.

1. Combined cycle plants (combine gas turbines and conventional thermal steam plants) have a very good load following capacity.
2. The gas turbine is more competitive in producing peaking power.

v. Power Purchases Alternative

1. Depending heavily upon purchased power is uncertain over the long run. Since hydropower development in Canada is publicly funded, it is likely that Maine would lose this power as Canadian demand grows over the long run. There is no data at this point on the price at which this power would be marketed. Is it certain that the Canadians will build the Dam and construct transmission lines which could efficiently transport the power to Maine.

1. New England can purchase capacity from outside the region to meet its needs. The Canadian government intention is to pursue the Gull Island Hydro Project on the lower Churchill River in New foundland indicates a potential source of peaking capacity for Maine. It is possible that Maine might be able to purchase firm capacity from this \$3 billion project which is expected to provide surplus capacity to Canada.

2. In August, Vermont announced the conclusion of a tentative agreement with Quebec for the purchase of at least 55 megawatts of power for a period of 20-30 years. The price yet to be negotiated, but with deliveries starting perhaps as early as 1981. Vermont's Electric Power Authority has indicated it could also carry Quebec's electricity to other American states.

*Additional aspects relating to Canadian Power purchases is contained in Attachment VI.

vi. Solar AlternativePros

1. The most efficient application of solar energy is in the heating and cooling of buildings.
2. Solar energy will not produce dependable peak load power.
3. Solar energy is not particularly suited to the New England Region.

Cons

1. The application of solar energy, although limited, is growing steadily and is relatively expensive.

Solar energy could be used to produce off-peak power which could be stored.

vii. Wind Alternative

1. Wind is not a reliable source of power. The amount of wind that can be produced at any moment is unpredictable.
2. Capital cost of wind generators are high and the maintenance costs are yet undefined.

1. Wind considered in conjunction with a storage system could be a reliable source of power.

2. The economics are still uncertain. Wind power could become competitive as the various sources become more expensive.

viii. * Small Hydro Alternative

1. Small hydro (run of the river) does not have storage capacity and would not be a viable alternative for winter peaking power.
*See Attachment VII for discussion of small hydro alternative for Maine.

1. President Carter's National Energy Policy and the Army Corps of Engineers have indicated that there are a number of sites for small hydro that could be utilized for energy production.

ix. Tidal Alternative

1. At this time Passamaquoddy is not as cost-effective as Dickey-Lincoln according to the Army Corps of Engineers.
2. Periods of peak generation for tidal plants depend upon the tides and frequently do not correspond with periods of peak demand.
3. Double effect schemes require the sacrifice of some energy benefit to achieve some firm peaking capacity.

1. Tidal power in Passamaquoddy and Cobscook Bays in Maine, looked at over the long run, is an economic source of power. A recent life-cycle analysis of the Passamaquoddy project indicates that the project could well be economically feasible. It is still being studied by the Corps.

2. Double-effect schemes for tidal projects can be designed to provide some firm peaking capacity at an increased cost.
3. Large-scale tidal projects have major environmental impacts.

x. Conventional Pumped Hydro AlternativePros

1. Because of pumping and generating inefficiencies there is a net loss in energy production from pumped storage. A pumped storage plant normally generates only 65 to 75 percent of the energy used for pumping.
2. The pumping energy cost evaluation was based on variable unclear fuel costs of 3.6 mills per KWH and variable O&M costs of .15 mills per KWH. These pumping costs will increase in the future inflating the cost of pumped storage. There is also the question of whether low cost base load power will be available for New England in the late 1980's. This is an uncertainty at the present time.
3. The cost of pumped hydro was not determined on a site specific basis. They were based on averages and cannot therefore be considered as dependable estimates for individual sites such as Site Leo in Maine.
4. Pumped hydro in Maine would require an excess base load power from nuclear or fossil fuel generating stations.

Cons

1. A total of 52 potential sites for conventional pumped storage ranging in size from 275 MW to 7930 MW have been identified in New England.
2. If the cost calculations for Site Leo were done on an equal basis with Dickey-Lincoln (i.e., same interest rate and insurance costs) Site Leo could well be more competitive.
3. The economy of pumped storage results from the conversion of low-cost, off-peak energy to high value peak energy.
4. The environmental impact is minimal. A number of the pumped storage sites, including Site Leo in Maine, have the same capacity as Dickey-Lincoln but have much less an environmental impact at the site of the dam. Site Leo has 1,000 MW capacity and only floods 3,385 acres as opposed to Dickey-Lincoln with an installed capacity of 830 MW impacting on hundreds of thousands of acres.

A. ENERGY ECONOMICS (Continued)

ENERGY ALTERNATIVES (cont.)

xii. Lead-acid Batteries Alternative

Pros

1. The economics of battery storage like all other storage alternatives require a supply of low cost off peak energy.
2. Assuming mass production, capital costs are eventually expected to be competitive with conventional energy storage systems such as pumped hydro.
3. Battery plants can be located near the load center, therefore diminishing the need for transmission lines and decreasing transmission losses.

Cons

1. The lead-acid battery is predicted to be commercially available in plants as large as 800 MW with up to 10 hours of storage by about 1990.
2. At the present time battery storage is more expensive than conventional pumped hydro.
3. Environmentally, there are potential problems with battery plants associated with the ultimate disposal of spent electrolyte and the danger of accidental spillage.

xiii. Compressed Air Alternative

1. The world's first plant is currently under construction in Germany.
2. Research indicates that compressed air storage systems can be developed with installed capacity of between 2,000 and 3,000 MW.

1. The economics of compressed air storage has yet to be proven and it, as other storage systems, depend on the availability of excess base load power.

xiv. Conservation

1. The State Office of Energy Resources has calculated that optimum conservation measures in Maine can save, by 1985, an annual equivalent of 11,600,000 barrels of Number 2 fuel oil. Savings in space heating alone by reducing Maine thermostats to 60° would save approximately 1,680,000 barrels of Number 2 fuel oil which is approximately 80% of the total annual production of the Dickey-Lincoln project.

1. A public attitude must be developed that conservation is not doing without, but using energy efficiently so that we can do more with less and eliminate all waste.

CONSTRUCTION ECONOMICSPros

1. The cost benefit ratio of the project as calculated by the Corps is 2.1 to 1 based on an interest rate of 3 1/4%.
2. The Corps calculated the cost benefit ratio to be 1.2 to 1 at the 6 3/8% Federal funds rate of interest used for other Federal Water Projects. The Corps favorable cost benefit ratio incorporated power from downstream Canadian generation; and there is no cost or treaty agreement to assure a continuous economical supply.
3. The true benefits of Dickey-Lincoln are very significantly understated because the benefits of the project are measured in terms of fixed prices for alternatives. If the benefit cost analysis recognized that the cost of alternative non-renewable sources of power will increase but the non-capital costs of Dickey-Lincoln are nearly fixed (which is certainly realistic) then the benefit cost ratio for Dickey-Lincoln over the long-run could be overwhelmingly positive.
4. From a purely economic point of view, the project construction will be beneficial to Maine.

Cons

1. The interest rate of 3 1/4% is inappropriate and a higher rate could make the project unfeasible.
2. Even the 6 3/4% is perhaps too low, as government projects are not subject to taxes, and therefore, the true cost is understated.
3. Federal benefit to cost assessments are done with fixed prices. Dickey-Lincoln should be, as well. Electricity produced from hydro power will increasingly become cheaper to produce as oil and gas supplies dwindle and nuclear and coal costs rise to meet safety and anti-pollution requirements.
4. One consultant^{*} used the 8 1/2% rate which more closely approximates the market prime interest rate in mid-1978. This produces a benefit-cost ratio of .95 to 1. Eliminating project credits for re-development and downstream benefits for the reduced ratio to .37 to 1. The Federal Power Commission makes a further adjustment of 5.1% for taxes. This would further reduce the ratio to .67 to 1.

* See Attachment VIII for the computations of Professor Lawrence G. Hines, Dartmouth College; Hanover, NH

A. ENERGY ECONOMICS (Continued)

PROS

CONS

MARKETING

- | | |
|--|---|
| <p>1. Maine is scheduled to receive 44% of the total energy produced by the project.</p> <p>2. The intermediate power will be available for Maine.</p> <p>3. In addition to the power generated by the project, 175 kilowatt hours of power could be available from arrangements are pursued.</p> <p>4. * Preferences Clauses for the sale of Federal power require that first preference in marketing be given to cooperatives and municipals. The largest cooperative is in Washington County which is not a prosperous County.</p> <p>5. NEPOOL members (private utilities in New England) who formally opposed the project in the past now have taken a neutral position on the project, recognizing the need for future peaking power in New England.</p> | <p>1. Maine will receive only 22% of the capacity of the project. Approximately 33% of the power benefit derived for Maine would come from downstream Canadian generation for which there is no agreement regarding cost of delivery.</p> <p>2. This intermediate power will not eliminate the need for new generating capacity for Maine, nor will it provide the significant cost differential necessary to attract industry.</p> <p>3. There are no treaties or guarantees that any part of the Canadian power will be made available in the United States at reasonable prices.</p> <p>4. The project espouses the development of public power overwhelmingly rejected by Maine voters.</p> <p>5. The NEPOOL private utilities are concerned that if the Preference Clause is not modified, they will not be able to utilize Dickey-Lincoln power for their customers. Under the Preference Clause, customer-owned cooperatives and municipals would have first preference for the power.</p> |
|--|---|

* See Attachment IV for further discussion of the "Preference Clause"

B. COMMUNITY AND ECONOMIC IMPACTS

If the Dickey-Lincoln School Project was constructed, families would be displaced from their homes, forest industry jobs would be lost, and some dislocations would take place in the agricultural sector. However, the area would experience eight years of economic boom. Sixty-eight permanent jobs would be created. The Upper St. John River would benefit from flood control. This Section looks at Community and Economic impacts of the project in more detail. The information and ideas presented here lean heavily upon the Department of Conservation's analysis of the project, E.C. Jordan's work as a consultant to the Army Corps of Engineers on the project, as well as the work of numerous consultants and specialists in related fields.

a. RELOCATIONS

PROS

1. The 161 families would be relocated at Federal government expense, considering the area flooded this is a relatively small number of people to be dislocated.
2. The negative social and cultural problems projected for the boom period of construction never materialized in expansions at Hinckley, Jay, or during the construction of Maine Yankee at Wiscasset.
- * Fully 42 percent of the jobs resulting from construction would be taken by persons from out-of state. In-state jobs that would be created might well have a long-range negative impact to the extent they would draw from other permanent, vital industries and activities in Aroostook County, such as potato farming which already has labor problems. A boom-town atmosphere would most certainly bring about problems in such areas as alcohol and drug usage, and a resulting increase in traffic accidents and fatalities. The State would certainly have to anticipate a strain on its social service agencies and there would be additional stress on the State budget due to welfare and unemployment demands during periods of layoffs or work stoppages. These are elements which cannot be measured, but which must be considered.

CONS

1. 161 families from the Allagash area will be uprooted by the project. The community life of these people would be altered significantly.
2. The culture and lifestyles of residents of the project area will be adversely affected by out-of-state workers.

The more urban environments of Hinckley, Jay and Wiscasset can not accurately be compared to the rustic Allagash area.
- * 3. The boom bust effect during the construction phase would strain housing, schools, roads, utilities, cemeteries, and other facilities in nearby towns.
4. Unless provisions are made, taxes accruing to the involved township and the State would be lost; amounting to \$97,000 for forest land and \$40,000 to the Town of Allagash.

B. COMMUNITY AND ECONOMIC IMPACTS (Continued)

b. *JOB IMPACTS

PROS

CONS

- | | |
|--|---|
| <p>1. The construction impact will last eight years with peak employment of 1,900 people. The total wage and salary bill is expected to be approximately \$100 million. Fifty-eight percent of the construction jobs are expected to go to Maine residents according to E. C. Jordan Study.</p> <p>2. The average wages earned during construction will be far higher than those currently earned in the region. According to the Davis-Bacon Act, wages for construction workers would equal those paid in other Federal projects.</p> <p>3. The construction boom spending, including the multiplier effect would strengthen the economy of Aroostook County and the Maine economy as a whole.</p> <p>4. Land east of the St. John which now sends wood to Canada would be cut off from Canadian markets and would be more accessible to Maine mills.</p> <p>5. A DOC Study found that the power savings exceed the losses in income to Maine people dependent on the forest resource in the impoundment area and the buffer zone.</p> | <p>1. Forty-two percent of the construction jobs are expected to go non-residents.</p> <p>2. The higher wages paid at the project could raise the overall wage rates in the region. This could adversely affect small farmers and other small businesses that might not be able to offer labor at the higher price.</p> <p>3. Maine's forest economy would be negatively affected when 110,939 acres of forest land (impoundment, buffer zone, and the transmission lines) are taken out of production.</p> <p>4. 206,000 acres of forest land would be isolated from Maine wood markets.</p> <p>5. The DOC Study also indicated that under current market conditions the loss of this would cost the State \$58 million, (this was discounted at 6%) in wages and salaries. <u>The actual loss could be even greater as new uses (such as petrochemical feedstock) are found for wood.</u> The future value of this wood resource cannot be predicted.</p> |
|--|---|

The job impact from construction and operation of the Dickey-Lincoln School Project is discussed in considerable detail in Attachment V.

c. FLOOD CONTROL

- | | |
|--|--|
| <p>1. The project has flood control benefits. 1. for the urban areas of Fort Kent, other communities for rural farmlands in the area which have been flooded in the past after planting. The Army Corps of Engineers has estimated the annual value of these benefits to be \$699,000.</p> | <p>There are less expensive and more direct techniques for reducing flooding of the St. John Valley. Dikes have recently been built and have proven to be effective. Other examples include insurance, flood plain regulation, evacuation and a less costly local dam.</p> |
|--|--|

C. ENVIRONMENTAL IMPACTS

The sources of data examined for environmental impacts include the U. S. Army Corps of Engineers Environmental Impact Statements, numerous consultant and private individual reports, state agency reviews, and a Corps contracted study with Normandeau Associates examining mercury levels in Northern Maine streams, lakes, and fish.

Overall, from the standpoint of the stability and productivity of the existing natural environment, the project will have an adverse impact. The most significant impact will be the loss of future productivity from over 80,000 acres of commercial forest land lost to the impoundment and buffer zone. The project would also despoil one of the last remaining wild areas and free-flowing rivers in the Eastern United States. The transmission lines will cross undespoiled wild areas and rivers in Northern Maine. IN all, 0.6% of the state's forest resources will be inundated, used for the buffer zone or removed for the transmission line right-of-way. Another 1.1% of the state's forest land adjacent to the Canadian border will be isolated from the impoundment and made inaccessible from Maine.

White water canoeing and wilderness camping would be eliminated from the project area. The benefits of the man-made recreation attractions will largely depend on the investments in facilities such as campsites, beaches, nature trails, etc., and the vagaries of the lake fishery.

a. TERRESTRIAL ECOSYSTEM

PROS

1. Terrestrial habitat would be replaced by aquatic, seasonally-flooded areas.
2. The delta sites, caused by sediment despotition at the mouths of tributaries to the reservoirs, may be vegetated by emergent wetland plants.

CONS

1. Project would inundate 88,000 plus acres of terrestrail habitat.

b. FOREST RESOURCES

1. A large volume of timber will be harvested during clearing of the impoundment site, so that this portion of the forest inventory cannot be considered as a loss.

1. Some of the most productive forest land in the watershed occur within the area are to be inundated.
2. 88,000 acres would be flooded by the project. New transmission line right-of-ways and access roads would require 4,083 acres.
3. 13,400 acres of forest land would exist as islands, being less accessible for harvesting.
4. An additional 206,000 acres of forest land would be isolated from Maine wood industry markets.

C. ENVIRONMENTAL IMPACTS (Continued)

b. FOREST RESOURCES (Continued)

CONS

5. Timber harvesting operations could also be impacted by set-aside of additional forest lands for fish and wildlife mitigation.
6. Disruption of approximately 75 miles of private forest access roads with resultant increase in timber transportation costs.
7. 1.1% of the state's forest resource adjacent to the Canadian border will be isolated by the impoundment and made inaccessible from Maine.

c. WILDLIFE

PROS

1. A temporary increase in some animal populations such as small mammals and deer, may occur due to the increased understory/browse growth following clear cutting and prior to flooding.

CONS

1. Conversion of approximately 88,000 acres of terrestrial habitat to aquatic habitat will result in concomitant loss of resident wildlife, as well as reductions in wildlife using the site for a portion of the year (e.g. whitetail deer wintering areas)
2. It is projected that one-half of the deer in 23 townships of the St. John Region would be affected due to loss of wintering areas to the impoundment.
3. Animal movements would be adversely affected by the reservoir, particularly deer which migrate between summer and winter ranges.
4. Birds of prey such as osprey, hawks, and owls would lose preferred habitats due to flooding.
5. Dickey Reservoirs would inundate 30 identified ponds and numerous beaver ponds.

d. FISHERIES

PROS

1. The U. S. Army Corps suggests an investment of \$5,000,000 to develop a lake trout or salmon fishery.

CONS

1. If the impoundment is built, 248 miles of stream fishery for brook trout will be replaced by a lake fishery of unknown value.
2. To sustain a viable lake fishery for trout or salmon will require development of a hatchery supported by a permanent staff of biologists. Corps has not specified where and how hatchery would operate.

C. ENVIRONMENTAL IMPACTS (Continued)

d. FISHERIES (Cont'd)

PROS

CONS

3. Fishing could be difficult at some acres of the impoundment due to submerged tree stumps and floating debris.

e. RECREATION

1. Day-use activities in the area would increase including swimming, recreational boating, family camping and sightseeing.
1. Swimming would be limited due to the very short season. Boating would initially be limited due to floating debris. All recreational usage would be dependent on adequate provisions and investments in facilities.
2. Whitewater canoeing would be eliminated in the project area. The project site is one of the few remaining wild areas in the Eastern United States containing a free-flowing river.
3. Wilderness type of camping will be eliminated in the project area.
4. Reduction of game populations, particularly deer, would result in concentration of hunters in a smaller area, competing for less game.
5. Water level fluctuations associated with Lincoln School reservoir would seriously alter recreational use of the impoundment.
6. A Corps of Engineers contract study by Normandeau Associates, Inc., found that mercury will accumulate to unacceptable levels (according to EPA standards) in salmonoid fish in the impoundment. This could prohibit Maine Inland Fish & Wildlife from promoting a fishery in the impoundment.
7. The Maine Department of Environmental Protection does not believe water quality will be as high in the impoundment as the Corps of Engineers indicates. Water may be brownish in color and take 6-9 years to stabilize in quality.
8. Lack of determination of recreation facility costs and commitment to facility construction makes determination of recreation and associated economic benefits uncertain.
9. Stressed tress at the edge of the impoundment may be subject to disease, insect attack and windthrow (blow-down) discouraging recreation. Also discouraging recreation would be the 18,000 acre "ring" around the lake which will likely be devoid of vegetation due to winter temperatures and ice scouring in the spring.

C. ENVIRONMENTAL IMPACTS (Continued)

f. LAND USES

PROS

1. Extensive development of recreation facilities at the Dickey impoundment could attract increased numbers of transient visitors to the area.
2. The impoundment would reduce peak flood-flows downstream at the Fort Kent damage center by 50 percent.

CONS

1. Known sand and gravel deposits receiving sporadic use will be covered by the impoundment.
2. The impoundment would cause rise of the local ground water table with little impact since residents are to be relocated.
3. Eight archeological sites and one historic site which appear eligible for inclusion in the National Register, in addition to the Big Black archeological site, which is within the impoundment area and currently included on the National Register.
4. Approximately 75 miles of existing woods road network will be disrupted.
5. Unless provisions are made, taxes accruing to the involved townships and the state would be lost, amounting to \$97,000 for forest land and \$40,000 to the Town of Allagash.

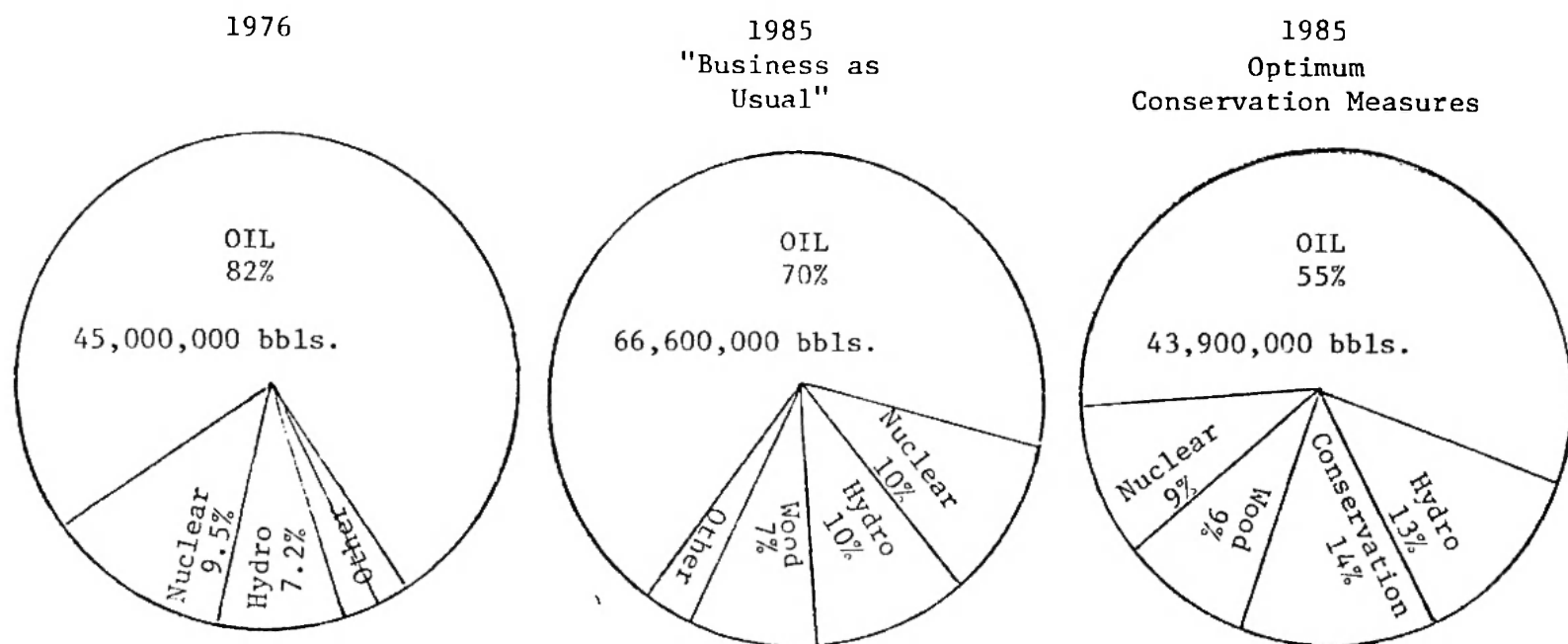
g. GEOLOGY AND SAFETY

1. The current appropriation request in the President's budget includes funds to look into the geological conditions further.
1. The Maine Geological Society expressed serious concern regarding insufficient data on the distribution of glacial sediments, and bedrock geology in the vicinity of the impoundments. This data is important in determining the suitability of the selected sites to support the massive construction which can sustain earthquakes or unstable bedrock conditions.

Maine is a State heavily dependant on petroleum for its energy requirements. This dependence is depicted in Figure 1. The goal of conservation must be to curb the extent to which we rely on petroleum products. Figures 2 and 3 depict a 1985 scenario. Figure 2 depicts a "business as usual" situation, and Figure 3, the situation if a vigorous conservation program is pursued.

In view of the present virtual moratorium on new nuclear construction, the 1985 figures cannot show the badly needed swing from petroleum dependence and, thus, projects a situation very similar to 1976 adjusted for 4% annual growth.

SOURCES OF MAINE ENERGY



Conservation simply makes good economic sense. It saves our resources, contributes to our economic well-being, and reduces our dependence on foreign oil with its devastating effect on inflation and our balance of payments. Conservation is not necessarily doing without nor is it anti-industrial development: It is using energy in the most efficient possible manner.

D. CONSERVATION (Continued)

The following table depicts estimates by the State Office of Energy Resources for annual savings from the following conservation measures in Maine alone:

1. Strict enforcement of the 55-mile-per-hour speed limit.
2. Reduction of speed limit on primary interstate highways to 50-miles-per-hour.
3. Weatherization.
4. Thermostat set back.

PRESENT VOLUNTARY ALTERNATIVES TO DICKEY-LINCOLN

<u>MEASURE</u>	<u>Barrels of Oil</u>	<u>PERCENT OF DICKEY-LINCOLN OUTPUT</u>	
		<u>Maine's Share</u>	<u>Total Project Output</u>
Enforcement 55MPH Speed Limit	280,400	28%	12%
Reduce Speed to 50 MPH on Primary Interstate Highways	802,400	78%	35%
Weatherization	4,600,000	498%	224%
Thermostat Set Back to:			
65° F	840,000	90%	40%
60° F	1,680,000	183%	82%

These figures, although estimates, clearly depict the tremendous contribution of conservation measures, and incidentally puts in perspective the modest power contribution of the Dickey-Lincoln Project.

DICKEY-LINCOLN PROJECT

ENERGY DIMENSION

IS THE PROPOSED DICKEY-LINCOLN PROJECT AN OPTIMUM USE OF THE ST. JOHN RIVER RESOURCE?

This statement focuses primarily on the energy dimension of the Dickey-Lincoln Project although comments touch economic and environmental concerns as well since they are inextricably woven together. The statement is brief, even though its conclusions are based upon a thorough study of the project and many hours spent considering the long-term implications of the proposed development.

At the outset, we should recognize that this region is heavily dependent upon limited supplies of foreign oil for its electric generation. New England depends upon imported oil for 56% of its electric generating capacity. In Maine, that figure is 31%, soon to increase to 44% with the addition of the W.F. Wyman #4 unit at Cousins Island. State, Regional, and National energy policies all call for decreased dependence on oil through conservation and the development of alternatives with special attention given to renewable sources of energy. The St. John River in Maine is an important potential source of renewable hydroelectric energy that will almost certainly increase in value in the future. This River is a state asset which could be very important to Maine's future. This is especially true for Northern and Eastern Maine which now depend upon uncertain and expensive Canadian power for a major part of their electrical needs. As a state resource, the River, if developed, ought to be developed in the best long-term interests of the people of Maine, with adequate sensitivity to our regional responsibilities.

There are serious questions as to whether the Dickey-Lincoln project, as it is now designed, is, from an energy point of view, in the best long-term interest of this state. There is little question that the project is a feasible energy investment over the long-run considering future price increases in nonrenewable energy resources. It is questionable whether it is the best energy investment on the St. John River. All the research done on the St. John River has not yet answered the question of what is the best way to develop the St. John River for hydroelectric power. We are faced with the decision to either build or not build a particular project without full knowledge of the alternative hydroelectric possibilities for that River.

The project under consideration (Dickey-Lincoln) is, from an energy point of view, designed primarily, although not exclusively, as a peaking power project. This might not be the best energy development for the St. John River. Preliminary investigations by the Maine Office of Energy Resources of alternatives for the St. John suggest that there could be base load oriented alternative hydroelectric development possibilities which could prove to be superior for Maine from the economic, environmental and energy points of view. A thorough study of base load hydroelectric alternatives for the St. John River should be undertaken before we proceed with Dickey-Lincoln as it is now defined. The following reasons are offered for this conclusion:

- (1) Base load electric power is more important for economic development than is peak power. A Maine oriented base load development on the St. John would be much more important to Maine's long-term economic health than would Dickey-Lincoln.

- (2) It is unlikely that the State of Maine could, in the foreseeable future, have the need for the 900 MW peaking power to be produced at Dickey-Lincoln even if the preference clause issue could be somehow resolved to make more power available in Maine.

- (3) A base load oriented project may not require a new high voltage transmission system routed through the wilderness of Northern Maine, thereby minimizing the environmental impacts.

(4) Many electric systems in New England are either in the process of implementing or considering implementing policies to encourage off-peak use of electricity. The implications of such policies cannot be predicted at this time, although they will almost certainly result in a diminished need for the type of high capacity peaking power to be produced at Dickey-Lincoln.

(5) If sufficient nuclear or coal capacity is built in New England, then pumped storage could be a more economical source of peaking power in New England.

(6) A Maine oriented base load project would likely require a smaller impoundment than would the Dickey Project.

The Dickey-Lincoln Project, if built, will determine the use of over fifty miles of an important river and over 88,000 acres of forest land for over 100 years. There are important questions to be answered, and they should be answered even though further time and resources might be expended. From Maine's energy point of view, the essential question has not been addressed, and that is, "What is the best hydroelectric development for the St. John River?" It is not suggested that a final decision should be based solely upon Maine's interests, but we should know the answer to this question before the project is built.

DICKEY-LINCOLN PROJECT

"PREFERENCE CLAUSE"

DICKEY-LINCOLN

"PREFERENCE CLAUSE"

Guidelines for marketing power from federal hydroelectric projects are set forth in Section 5 of the Flood Control Act of 1944 (16 U.S.C. 1970 ed. Sec 825s) which says, among other things, that:

..."Preference in the sale of such power and energy shall
be given to public bodies and cooperatives."

There are at present nine (9) major preference customers in Maine, and they purchased a combined total of 231 million kilowatt-hours in 1976. Maine's share of the Dickey-Lincoln output is estimated to be 533 million kilowatt-hours. The Power Marketing Analysis by the U.S. Department of Interior indicates that preference customer load growth in Maine will be large enough to utilize Maine's total share of the base load energy from Dickey-Lincoln.

It is unclear at this time what opportunities private utilities in Maine (who serve the vast majority of the state's electrical customers) will have to participate in the output from this project. Also unclear at this time is whether preference customers outside of Maine will receive priority distribution of the Dickey-Lincoln output before in-state private utilities are permitted to participate.

NOTE: In 1973, the voters of Maine overwhelmingly rejected a public power proposal. This project imposes the public power concept without providing the citizens of Maine an opportunity to reverse this expression. No public official should circumvent the position of a majority of the people once it has been expressed at the ballot box.

DICKEY-LINCOLN PROJECT

JOB IMPACTS

JOB IMPACTS
CONSTRUCTION AND OPERATION OF
DICKY-LINCOLN

Jobs related to Dickey-Lincoln must be broken down between those during the construction and those during operation of the project. Because the project creates an energy facility with relatively small operational requirements, the number of jobs, created during the operational phase will be much smaller than those created during construction. The two phases are therefore considered separately.

I. Construction

Construction of the Dickey-Lincoln Dams and associated transmission facilities will take approximately 8 years. During that time, the number of workers employed in construction will vary from year-to-year, with different skills required at different phases of the project. Because the work will be concentrated from the fourth through the seventh year of construction, the Draft Environmental Impact Statement (DEIS) divides its estimates of employment into two periods: Years 1 through 3, plus Year 8; and Years 4 through 7.

Table 1 presents the total employment for Construction of Dickey-Lincoln and the Transmission Lines (All references to employment on construction of the transmission lines refers only to that employment building that portion of the lines in Maine. It excludes employment building the lines in New Hampshire and Vermont)

	<u>TABLE I</u>	
	<u>Years 1-3, and 8</u>	<u>Years 4-7</u>
Dickey-Lincoln	278	1706
Transmission Lines		483
Total	278	2191

(See footnotes, page 5)

Table 2 presents the DEIS estimates for the number of workers that can be expected to come from the Aroostook County area, the rest of Maine, and outside of Maine.

	<u>TABLE II</u>			
	<u>Aroostook County</u>	<u>Rest of Maine</u>	<u>Total Maine</u>	<u>Out of State</u>
Years 1-3, 8	61	81	142	136
Years 4 - 7*	374**	501**	1141*	1050*
Percent of Total	22%	29%	52%	

* Includes Transmission Lines

** Because the employment data in the DEIS on the transmission lines does not distinguish between Aroostook County and the rest of Maine as the Dickey-Lincoln DEIS does, these figures are for the Dickey-Lincoln dams only.

It should be noted that the methodology used to estimate the number of jobs which will go to Maine and Aroostook County residents may overstate the number of jobs in these categories, especially in the case of Aroostook County. The DEIS based these estimates on the availability of skills in the various categories required by Dickey-Lincoln in Aroostook County and Maine, and assumed that where there was unemployment in a skill, those unemployed in the local area would be hired first. For example, if carpenters were needed, those unemployed carpenters looking for work in Aroostook County would be hired first, then carpenters from outside of Aroostook County. There is a further assumption that the remainder of carpenters would come from Maine.

This method probably overstates the situation with regard to local hires because there is no guarantee that jobs will go to unemployed individuals. Those currently employed at the time of the project may seek to work there because of the relatively high wage rates (See below). Thus, those who find work at Dickey-Lincoln will be first-come, first-hired based, of course, on experience. There would be no way to assure that Aroostook County, or even Maine residents in general, will be hired in the proportions indicated. However, the DEIS projections on hiring Maine residents may be "in the ballpark" since the remoteness of the Dickey-Lincoln site will not encourage many out-of-state residents to come seeking employment there. Thus, this paper will continue to use an approximate figure of 52% hired from Maine.

Despite the uncertainty which surrounds these figures in Table II, it can be said with some confidence that the Aroostook County area will contribute primarily laborers to the project, with a variety of skilled workers (carpenters, electricians, painters, plumbers, millwrights, iron workers, etc.) coming from Aroostook County or the rest of Maine. Operating Engineers and Teamsters are the largest skilled categories requiring out-of-state workers.

Table III presents the estimated total wage and salary income which can be expected from the project. In this table, net income is defined as gross income less 30% for state and federal taxes, and personal benefit contributions.

TABLE III

	<u>Gross Income</u>	<u>Net Income</u>	<u>Net Income to Maine Workers</u>	<u>Net Income to Out of State Workers</u>
Dickey-Lincoln	99,450,000	69,150,000	35,503,650	33,646,350
Transmission Lines	8,000,000	5,610,000	3,100,000	2,500,000
Total	107,450,000	74,769,000	38,136,500	35,963,500

Table IV presents annual averages and totals of net wage and salary income for the two major periods of construction.

TABLE IV

	Years 1-3,8		Years 4-7*	
	Total	Maine	Total	Maine
Total for Period	\$11,306,025	\$5,766,073	\$62,536,740	\$32,519,105
Annual Avg.	\$ 2,826,506	\$ 1,441,518	\$15,634,185	\$ 8,129,776

* Includes Transmission Line Construction

These income estimates are based on wage rates which must, by federal law, be no less than other federal wages in the area for skill categories required. This means that the average hourly wage across all skill categories for Dickey-Lincoln will be approximately \$8.00. This is roughly 130% higher than the current wage levels in these categories in Aroostook County. The unskilled hourly wage rate will probably be around \$5.00 an hour, almost triple the current wage rate on farming in the area. These wage rates will certainly attract job seekers from a much wider area than Aroostook County.

The effect on unemployment in the Fort Kent-Allagash region is likely to be minimal. If all the currently unemployed people in the Fort Kent area in the various skill categories required by Dickey-Lincoln were hired for the project, the unemployment rate in the area would drop approximately 25%, from 9% to 7%. However, as indicated above, this is not likely to be the case.

In fact, the history of major projects in remote areas such as Dickey-Lincoln has shown that unemployment rates in the local area actually tend to rise during construction. This is due to the large number of workers who come to the area seeking employment but not finding it, or finding it only for relatively short periods but remaining on the chance of working again. There may also be high seasonal unemployment in the area, since most of the work must be done during the summer. Overall, therefore, there is not likely to be any significant betterment of the unemployment rate from construction of Dickey-Lincoln.

Secondary employment from construction of Dickey-Lincoln is difficult to estimate. The DEIS makes a projection of 500-600 in Aroostook County, using a multiplier of 1.55. However, the DEIS is based on the erroneous assumption that remote areas have higher multipliers. In fact, the opposite is true. Because remote areas have relatively fewer goods and services to offer, money earned in construction job will probably be saved and then taken out of the area when the worker leaves. There will certainly be secondary employment in the area created by Dickey-Lincoln, but it is likely to be much less than the 500-600 jobs projected in the DEIS.

There are likely to be several negative effects in Aroostook County as a result of Dickey-Lincoln. The most significant of these negative effects will probably be the inflation in wage rates brought about by the legally-required high wage rates at the project. The effect will be most severe on the availability of agricultural workers in Aroostook County, although it may not be a direct effect of Dickey-Lincoln jobs. That is, some farm laborers will seek jobs working on Dickey-Lincoln, but only a few will be hired relative to the total number of farm workers. However, as Dickey-Lincoln pulls other non-skilled workers from Aroostook County because of its high wage rates, farm workers may seek other non-skilled jobs thus left vacant. The higher wage rates of Dickey-Lincoln may thus drive the price of non-skilled labor to the point where some small farmers cannot afford the price of labor and will be driven out of business. It is not clear, however, how many farmers would be affected.

Other employers of non-skilled, and skilled workers in Aroostook County will also see their labor prices rising, with a resulting spread of general inflation throughout the labor market. This may also affect small contractors and other firms adversely, though again it is difficult to estimate the exact number.

It should also be noted that there will be a large influx of dollars into the area economy from the wages and salaries and from any locally-purchased supplies. This will lead to an inflationary situation in the local economy which will degrade the real incomes of existing residents, and may induce a local wage-price spiral for the four years of peak activity at the dams.

II. Operation

Job impacts during the Operation phase will be derived from three primary sources:

(1) Jobs operating and maintaining the dams and power facilities. The DEIS estimates that there would be 68 such jobs, 60 of which would be filled from area residents. This is, of course, a relatively small addition to the area work force, and would not generate significant secondary employment opportunities.

(2) Jobs created as a result of economic development engendered by the electricity made available by the power generating facilities.

The creation of such jobs is highly speculative. It would depend on the extent of utilization of Dickey-Lincoln's intermediate power for industrial use. This is impossible to predict at this time. It is conceivable that the electric systems in the state could make full use of the intermediate power to be generated, leaving none left over for economic development, but it is probable that at least some power would be available for development.

(3) The jobs lost in the forest harvesting industry from the flooding of the impoundment area.

Again, it is very difficult to predict how many jobs would be lost from the impoundment area flooding. A Department of Conservation report estimated that there would be a loss of \$990,617,000 in value added from the lost forest resources, part of this value added is wages and salaries, although it is not possible to make an exact determination of wages and salaries lost from this figure.

However, it is likely that at most, if not all, those who would be employed cutting in the impoundment area would find employment in other areas of the woods; this is especially likely if more intensive use of the forest resources is made over the remainder of the century.

Footnotes

1. U. S. Army, Corps of Engineers,
New England Division
Draft Environmental Impact Statement,
Dickey-Lincoln School Lakes, Appendix H.
Waltham, Massachusetts: 1977
2. U. S. Department of Energy,
Draft Environmental Impact Statement
Dickey-Lincoln School Lakes
Transmission Project
Bangor, Maine: 1977

DICKEY-LINCOLN PROJECT

POTENTIAL CANADIAN POWER PURCHASES

POTENTIAL CANADIAN POWER PURCHASES IN RELATION TO DICKEY-LINCOLN

The Canadians have indicated an interest in selling electric power to the United States.

CLASSES OF TRANSACTIONS

There are three classes of transactions for electric power potentially available at this time.

I. Firm Capacity Power

New Brunswick is now constructing a nuclear plant at Point LePreau on the Atlantic Coast. They have indicated an interest in negotiating for 150 MW of base load power. This could possibly be purchased by a Maine utility for a fixed period of time, perhaps 15-20 years. Maine utilities through NEPOOL may be considering such purchases. It is Canadian Government policy to limit the duration of such contracts so that the power could be available later as Canadian needs grow to meet their expanded capacity. Such contracts allow the Canadians to take advantage of the economies of scale of large plants without forever giving up ownership and use of these larger plants.

The Canadians have also indicated a willingness to sell electric capacity from the following very large facilities:

Churchill Falls, Labrador

5225 MW, in service since 1974. Most of output from Labrador to Quebec, a provincial transfer, a small fraction staying in Labrador. Quebec then transfers some power to New York (PASNY).

James Bay, Quebec

10,000+ MW, \$16.2 billion cost. This project has been under construction since 1974, and is due for completion in stages between 1980 and 1985.

Gull Island, Labrador

1800 MW nominal capacity, \$2.9 billion construction cost, half of which is for the transmission lines to Newfoundland. Generating station cost about \$1.5 billion. Part of the output is for Newfoundland, the balance will go to Quebec. A private corporation, the Lower Churchill Development Corporation, will be set up later this year and they will be responsible for marketing the power from Gull Island.

II. Seasonal Diversity Transfers

Seasonal Diversity Transfers are transfers of power between areas that experience different seasonal peaks. For example, Quebec is a winter peaking system and is currently selling capacity to New York during the summer since New York is a summer peaking system. New England, on the other hand, is a winter peaking system at this time. Therefore, this seasonal diversity power does not appear to be particularly useful to New England.

However, it is possible that summer peaking might be worth looking into from Maine's point of view in the long run. Summer's experience with low head hydro indicates that production can be significantly affected during dry summer periods. If Maine could purchase power from Canada during the summer, this might make low head hydro development more attractive to Maine. This is a possibility that we shall continue to pursue in our assessment of low head hydro potential. Preliminary discussions with Hydro Quebec indicate that a significant amount of summer capacity could be available. However, this class of power is not a specific alternative to Dickey-Lincoln.

III. Economy Energy

Quebec is largely dependent on hydro for its electric generation. The amount of hydroelectric energy they generate varies throughout the year depending upon water availability. They are interested in selling surplus energy from their system "when it happens to be available." This type of "incidental" energy cannot be depended upon to supply new capacity needs.

However, this type of energy is worth looking into further, as it is sold at discount prices and can be used to save oil and cut back on production at more expensive plants. This type of transaction is worth purchasing with the objective of possibly decreasing the price of electricity, but not as a source of new generation capacity such as Dickey-Lincoln.

COMPARATIVE ECONOMICS

It should be noted that we do not know what the specific economics of these suggested transactions would be at this time, and there are questions with regard to the long term availability of such power. Some of the uncertainty regarding Canadian purchases stems from the fact that contracts are controlled by both the Federal and Provincial Governments.

The Canadian Government, through the National Energy Board, regulates the exportation of electricity from Canada. The National Energy Board, in considering an application to export power, must satisfy itself that the quantity of energy to be exported is surplus over reasonably foreseeable Canadian requirements, and that the price to be charged is reasonable in relation to the public interest. In addition, the Board is required to consider all matters that appear to be relevant, giving them a fairly broad mandate.

To ensure that an export price is just and reasonable, the Board has developed three criteria that the price must meet. Firstly, it must cover fully the cost of energy to be exported. Secondly, it must not be less than the price to Canadians for comparable service. Thirdly, it should not be markedly less than the least-cost alternative available to the foreign purchaser.

TRANSMISSION

The only direct connection for Maine to the Canadian System is one line through New Brunswick. This line has the capacity to accommodate the 150 MW of the Point LePreau plant if some Maine utility does decide to purchase that capacity. Further increases in power exchange could well mean new transmission systems. This whole question of transmission needs to be looked into further at the point at which we might begin more specific planning in terms of the importation of power from Canada. It is possible that the Dickey-Lincoln project could in fact facilitate the purchase of Canadian Power by virtue of the transmission system which would be underutilized during off peak hours.

VERMONT TRANSACTIONS

Vermont is negotiating with Quebec a short term arrangement to fill gaps for the next few years, and a longer term agreement to transmit power to NEPOOL for New England consumption. However, no agreement has been signed between Vermont and Quebec.

SUMMARY

There is a possibility of purchasing nuclear power from Point LePreau. This could be similar to Maine's share of Dickey-Lincoln power. However, we would not be able to undertake a comparison of the economics until the completion of negotiations for the power.

It is also worth noting that a Point LePreau purchase might be advisable for Maine even if base load power were available from Dickey-Lincoln for Maine.

DICKEY-LINCOLN PROJECT

SMALL HYDRO ALTERNATIVES

SMALL HYDRO ALTERNATIVES

We have completed the first phase of an inventory of existing dams in Maine and have indentified about 2,000 dams. Data relating to these dams has been submitted to the U. S. Army Corps of Engineers for analysis as part of the New England River Basins Commission Hydro Power Study. Preliminary results to date, from this first phase inventory are very encouraging and indicate a substantial availability in terms of numbers and dispersal of sites, potential capacity, and energy production.

This inventory is the first step in assessing the hydro power potential of Maine's existing dams. We will now proceed to phase two with successive stages of screening and evaluation of the identified sites.

Results of the computer analysis of inventory data of 546 dams initially analyzed indicate that 229 of the undeveloped (non-generating) dams or about 42% of the total have a potential for 50 KW or more of generating capacity and need further evaluation.

The average capability of these dams is falling in the one-three megawatt range. These numbers are very preliminary, but give some indication of the magnitude of the resource that we are pursuing.

In the final analysis, the amount of hydro power brought on-line in Maine will be influenced by economics, institutional restraints, recreational concerns, and the ever-increasing magnitude of environmental impacts.

DICKEY-LINCOLN PROJECT

BENEFIT-COST SUMMARY

Dickey-Lincoln School Lakes Benefit-Cost Summary

(Hydroelectric Project, St. John River, Maine, U.S. Army Corps of Engineers

(March 1977 Price Levels)

<u>DAMS</u>	<u>3-1/4%</u>	<u>6-3/8%</u>	<u>8-1/2%*</u>
<u>Total Investment</u>			
Construction Cost of Dams	\$544,000,000	\$544,000,000	\$544,000,000
Interest During Construction	56,600,000	111,000,000	143,110,000
Present worth of future recreation facilities	236,000	170,000	136,313
Total	\$600,836,000	\$655,170,000	\$692,246,000
Capital Recovery Factor (Dams)	.03388	.06388	.08502
<u>Annual Costs</u>			
Interest and Amortization	\$ 20,356,000	\$ 41,852,000	\$ 58,859,477
Operation and Maintenance	2,100,000	2,100,000	2,100,000
Pumping Power (438,000,000 kwh x \$.010)	4,380,000	4,380,000	4,380,000
Major Replacements	315,000	166,000	101,000
Loss of Land Taxes	142,000	142,000	142,000
Lost recreational opportunities	193,000	136,000	122,000**
Subtotal Dams	\$ 27,486,000	\$ 48,776,000	\$ 65,704,000
<u>TRANSMISSION LINES</u>			
<u>Total Investment</u>			
Construction Costs of Transmission Line	\$146,300,000	\$146,300,000	\$146,300,000
Interest During Construction	10,410,000	20,920,000	28,400,000
Total	\$156,710,000	\$167,220,000	\$174,700,000
<u>Annual Costs</u>			
Interest and Amortization	\$ 6,950,000	\$ 11,610,000	\$ 14,854,179
Operation and Maintenance	3,650,000	3,650,000	3,650,000
Reduction - future wheeling by others;			
Granite-Essex	-390,000	-450,000	-476,000
Subtotal Transmission	\$ 10,210,000	\$ 14,810,000	\$ 18,028,000
<u>TOTAL PROJECT</u>			
<u>Total Investment</u>			
Construction	\$690,300,000	\$690,300,000	\$690,300,000
Interest During Construction	67,010,000	131,920,000	176,510,000
Present Worth - future recreation	236,000	170,000	136,000
Total	\$757,546,000	\$822,390,000	\$866,946,000

Source: Table 1.07, "Economic Data," Dickey-Lincoln School Lakes Environmental Impact Statement (Waltham, MA: Corps of Engineers, August, 1977), pp. 1-23, 4.

*Computed following Army Corps procedures by Lawrence G. Hines, Economics Department, Dartmouth College, Hanover, N.H. 03755.

**Includes estimate of \$14,500 for loss during construction.

Dickey-Lincoln School Lakes Benefit-Cost Summary

(Continued)

	<u>3-1/4%</u>	<u>6-3/8%</u>	<u>8-1/2%</u>
<u>Annual Costs</u>	\$ 37,696,000	\$ 63,586,000	\$ 83,732,000
<u>Annual Benefits</u>			
Peaking Power (15.4% Capacity Factor)			
874,000 kw x .904 x \$30.00	\$ 23,703,000	\$ 23,703,000	\$ 23,703,000
1,182,600,000 kwh x .914 x \$.034	36,750,000	36,750,000	36,750,000
Intermediate Power (42.9% Capacity Factor)			
70,000 kw x .980 x \$68.50	4,699,000	4,699,000	4,699,000
262,800,000 kwh x .989 x \$.026	6,758,000	6,758,000	6,758,000
Downstream			
350,000,000 kwh x \$.010	<u>3,500,000</u>	<u>3,500,000</u>	<u>3,500,000</u>
Subtotal Power	\$ 75,410,000	\$ 75,410,000	\$ 75,410,000
<u>Recreation</u>	172,000	145,000	133,000
<u>Redevelopment</u>	1,691,000	2,689,000	3,198,000
<u>Prevention of Flood Damages</u>	<u>696,000</u>	<u>686,000</u>	<u>686,000</u>
TOTAL ANNUAL BENEFITS	\$ 77,969,000	\$ 78,930,000	\$ 79,427,000
TOTAL ANNUAL COSTS	\$ 37,696,000	\$ 63,586,000	\$ 83,732,000
<u>BENEFIT-COST RATIO</u>	2.1 to 1	1.2 to 1	0.95 to 1

1. Cost of pumpback energy is included in project Annual Operation and Maintenance Costs.
2. The .904 and .914 etc. factors noted in power benefit analysis reflect estimated reduction in capacity and energy outputs due to transmission line losses.

*The 6-3/8 entry for "prevention of flood damages" has been used instead of refiguring at 8-1/2% because the change is insignificant.

Dickey-Lincoln School Lakes Benefit-Cost Summary

(Continued)

At 8½%, the Dickey-Lincoln project costs more than it returns in benefits. That is, a ratio of 0.95 to 1 means that Dickey-Lincoln produces only 95 cents value for every dollar expended. (The 8½% rate was chosen because it is approximately the market prime interest rate in mid 1978.) Moreover, if such questionable project credits as redevelopment and downstream benefits are disallowed, the benefit-cost ratio is 0.87 to 1. Finally, if taxes are acknowledged as a cost by adopting the 5.1% adjustment used by the Federal Power Commission in its studies, the benefit-cost ratio for the Dickey-Lincoln project drops to 0.67 to 1.

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